Cattle, Conservation, and Collaboration

Can livestock agriculture and wildlife conservation coexist in areas of the world where they are in conflict but vital to people and planet?

Featured

Steven A. Osofsky
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by Jackie Swift

In the early 1990s, Steven A. Osofsky, Population Medicine and Diagnostic Sciences, was a young wildlife veterinarian recently graduated from Cornell and headed for southern Africa. One of the first things he noticed when he got there were the thousands of miles of fences covering the land. They were there to keep domestic beef cattle separated from wild buffalo because buffalo carry the virus for foot and mouth disease (FMD), which can sicken cattle and cause trade embargoes on beef from affected countries.

The fences also cut across the ancient migratory routes of the region's historically vast ungulate herds, with devastating consequences.

"Hundreds of thousands, if not millions, of animals have died along these fences since the 1950s because they couldn't get access to seasonal grazing and fresh water," Osofsky says. There was intense conflict between the livestock and wildlife sectors, and as Botswana's first official wildlife veterinarian, Osofsky saw it firsthand.

"Botswana is one of the last great places on earth for free-ranging wildlife," he says. "But fences are a barrier to the habitat connectivity these species evolved with over millennia, and they've significantly impacted the region's wildlife. I've spent a lot of time since the 1990s thinking about this land-use conundrum, wherein two sectors have been seen as impacting each other in such dramatically negative ways."

The One Health Strategy

Osofsky's concerns for wildlife and human wellbeing drove him to help catalyze an approach called One Health. "This is the overriding theme of most of my work," he says. "My focus is very much on wildlife conservation and the ways in which we can be better stewards of the environment and how that relates back to the health of wildlife, domestic animals, and people."

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The One Health approach led to Osofsky facilitating dialogue with southern African governments, international donors, the World Organization for Animal Health (OIE), the Food and Agriculture Organization of the United Nations, small farmers and farming communities, and others with a stake in the clash between the needs of wildlife and those of beef farmers in the region. He and his team worked with colleagues in the Southern African Development Community to identify the crux of the problem.

The international rules regarding the management of animal diseases were based on geography. The OIE's regulatory framework had long required any aspiring beef-exporting country or region where FMD was present in wildlife to physically separate wildlife from livestock. This led governments in southern Africa to erect extensive fences.

With today's scientific understanding and sophisticated food safety protocols, Osofsky and his colleagues concluded that the OIE's goals could be equally well served by focusing on the beef production process. Osofsky says, "Whether you're talking about *E. coli* or FMD or a parasite, how you deal with the product from a biosafety viewpoint is what you really need to worry about."

Osofsky continues, "You can process meat, vegetables, or any food by using standardized approaches based on good science, farm to fork as they say, to make sure the end products are safe for human consumption, while at the same time ensuring that a product like beef doesn't spread an animal disease. It took many years of dialogue before the OIE acknowledged that what is essentially a food safety approach is equivalent to the geographic, fence-based approach." In 2015 the OIE's World Animal Health Assembly updated OIE guidelines so that fences were no longer the only option for managing FMD in southern Africa.

Planetary Health, Innovation via Integration

As Osofsky worked on the fence problem in southern Africa as well as other environmental and wildlife conservation issues, he was able to utilize health concerns to gain policy traction. Eventually he brought together a diverse array of colleagues to help develop a new field subsequently dubbed Planetary Health by The Rockefeller Foundation.

"Planetary Health is about improving both our understanding of the public health impacts of anthropogenic environmental change and our ability to measure them," he says. "This can then improve decision making in the realms of land-use planning, ocean-use planning, environmental conservation, and public health policy. If governments want to dam the Amazon River's tributaries for hydroelectric energy, for example, but project assessments neglect to look at the millions of people who depend on migratory fish in that freshwater basin for protein and micronutrient nutrition, then we could be missing one of the largest real costs resulting from the dams. Many infrastructure projects have both positive and negative public health impacts. If we do a more thorough job assessing these impacts, we should make better-informed, more sustainable decisions."

Wildlife Health Cornell, a Center of Excellence

In 2016 Osofsky came full circle and joined the faculty of Cornell's College of Veterinary Medicine. He brought with him a vision of the college as a leader in wildlife health. One of his first steps was to help develop a flagship program called Wildlife Health Cornell, a College of Veterinary Medicine Center of Excellence.

"The array of exciting wildlife health work underway across the veterinary college, much of it involving other parts of the university as well as external partners, creates a window of opportunity to build a real community of practice," Osofsky says. "Wildlife Health Cornell is a way to capture all of the neat things the college is doing—and can do, going forward—to make sure we share what we're learning across campus and around the world."

In March 2017, the College of Veterinary Medicine received $1.7 million over three years from The Rockefeller Foundation to support Osofsky's work. With part of the funding, the Osofsky team is evaluating real-world applications of Planetary Health science policy. Their work will help inform policymakers at a range of scales so that the public health and wellbeing impacts of alterations to natural systems that people depend on are more proactively taken into account.

The other portion of the grant—as well as additional funding from the Atkinson Center for a Sustainable Future's Academic Venture Fund—will help local beef farmers living with wildlife in southern Africa undertake the next steps toward being able to sell their beef on the world market and will support the reevaluation of some of the fences impacting migratory wildlife.

KAZA, a Global Treasure

The focus is on the Kavango Zambezi (KAZA) Transfrontier Conservation Area, a conservation and development initiative that spans five countries—Botswana, Namibia, Angola, Zambia, and Zimbabwe. KAZA's wilderness is a global treasure and is home to roughly half of all remaining African elephants and many other endangered and threatened species.

Osofsky says countries like Botswana want to move the new approach to beef production forward. They have welcomed Cornell's technical support. In the fall of 2017, Osofsky is taking a team with him to Botswana, including Randy W. Worobo, Food Science; wildlife ecologist Shirley Atkinson from Osofsky's own team at the veterinary college; and leading southern African FMD experts and wildlife biologists.

Osofsky is optimistic that if this new approach to beef trade takes hold and the most problematic fences can be realigned or taken down, the historic migrations will return. A successful outcome for both the livestock and wildlife sectors could be a real boost for transfrontier

conservation and the sustainable development it is meant to engender. “There was an old fenceline in Botswana that got opened up a few years ago,” he says. “There were no living zebras that had ever made their ancestral migration across the region. And yet, as soon as the fence was no longer a barrier, the migration was restored. The zebras followed the same route used by previous generations. That tells me it’s not too late.”

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